

## CLAIMS

Claim 1-17: (cancelled)

Claim 18 (Currently Amended): A method for producing models in layers, comprising:

- (a) applying a first material in a layer on a building platform wherein the first material comprises a particulate material and a first reactive component;
- (b) selectively applying a second material to the first layer via a droplet production technique, wherein the second material comprises a second reactive component and a non-reacting carrying agent and calculating a quantity  $x_t$  of the non-reactive carrier agent to be used in the second material based upon the formula

$$x_t = \frac{m_h}{\left(\frac{r_p}{0,0254}\right)^2 \cdot v_{f,d} \cdot A_b \cdot \rho_h}$$

determined by the product of the weight of the particulate material of the first material and a desired proportional mass of the first reactive component,  $r_p$  is a value of resolution in dots per inch of the droplet production technique,  $v_{f,d}$  is a volume of liquid particles in the second material,  $A_b$  is an area of the layer to receive the second material, and  $\rho_h$  is the density of the second reactive component;

- (c) curing the first and second materials to form a solid; and
- (d) repeating steps (a) and (b) to achieve a plurality of layers to form a model, wherein the first material is a mixture of at least two components that is at least partially prepared prior to each applying step.

Claim 19 (Previously Presented): The method of claim 18, wherein the first material is prepared continually.

**Claim 20 (Previously Presented):** The method of claim 18, wherein the first material is prepared in batches.

**Claims 21 - 22(Cancelled):**

**Claim 23 (Currently Amended):** The method of claim 18, wherein the second reactive component is an binder.

**Claim 24 (Previously Presented):** The method of claim 18, wherein steps (a) and (b) are repeated before the curing step is complete.

**Claim 25 (Previously Presented):** The method of claim 18, wherein the first material remains porous during preparation.

**Claim 26 (Previously Presented):** The method of claim 18, wherein the selectively applying step comprises applying the second material using a droplet producing technique.

**Claim 27 (Cancelled):**

**Claim 28 (Previously Presented):** The method of claim 18, wherein the second material comprises a carrying agent.

**Claim 29 (Previously Presented):** The method of claim 18, wherein the curing step comprises forming a chemical bond between the first and second materials.

**Claim 30 (Previously Presented):** The method of claim 18, wherein the curing step comprises forming a physical bond between the first and second materials.

**Claim 31 (Previously Presented):** The method of claim 18, wherein the particulate material comprises a moulding sand chosen from the group including quartz sands, zircon sands, olivine sands, chamotte sands, and combinations thereof.

**Claim 32 (Previously Presented):** The method of claim 18, wherein the particulate material comprises a polystyrene powder, a polyamide powder, and combinations thereof.

**Claim 33 (Previously Presented):** The method of claim 18, wherein the first reactive component comprises furan resin, polyurethane resin, and combinations thereof.

**Claim 34 (Previously Presented):** The method of claim 18, wherein the model comprises a mould for a non-ferrous casting.

**Claim 35 (Previously Presented):** The method of claim 18, wherein the model comprises an investment pattern for a non-ferrous casting.

**Claim 36 (Cancelled):**

**Claim 37 (Previously Presented):** A method for producing models in layers, comprising:

- (a) applying a first material mixture in a layer on a building platform wherein the first material mixture comprises a quartz sand and a epoxy resin, wherein the epoxy resin is present between about 0.6 and 1.8% of the total weight of in the first material mixture;
- (b) selectively applying a second material mixture to the first layer via a droplet production technique, wherein the second material comprises a second reactive component and a non-reacting carrying agent, wherein a quantity  $x_1$  of non-reactive carrier agent to be used in the second material is calculating based upon the formula

$$x_t = \frac{m_h}{\left(\frac{r_p}{0,0254}\right)^2 \cdot v_{f,d} \cdot A_b \cdot \rho_h}, \text{ wherein } m_h \text{ is quantity of the epoxy resin as determined by}$$

the product of the weight of the quartz sand of the first material and a desired proportional mass of the epoxy resin,  $r_p$  is a value of resolution in dots per inch of the droplet production technique,  $v_{f,d}$  is a volume of liquid particles in the second material,  $A_b$  is an area of the layer to receive the second material, and  $\rho_h$  is the density of the second reactive component;

- (d) curing the first and second materials to form a solid; and
- (e) repeating steps (a) through (c) to achieve a plurality of layers to form a model, wherein the first material mixture is at least partially prepared prior to each applying step.